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# THE GENUS *EMPEDOCLES* STÅL AND DESCRIPTION OF ONE NEW SPECIES (HEMIPTERA: COREIDAE: COREINAE: ACANTHOCEPHALINI) FROM SOUTH AMERICA

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*Abstract.*—The genus *Empedocles* Stål is redescribed, and one new species collected in Brazil and Argentina is described; new distributional data for *E. tenuicornis* (Westwood) is included; dorsal view illustrations, and drawings of antennal segments, pronotum, hind leg, and male and female genitalia are provided.

*Key words:* Hemiptera, Coreidae, Acanthocephalini, *Empedocles,* new species, Neotropical.

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Brailovsky (1984) pointed out the sexual dimorphism in the genus *Empedocles* Stål based on the development of the hind tibia, which is narrower in the males with the inner expansion weakly developed and strongly spined, and the outer expansion with only one shallow emargination (Figs. 5, 7). On the females the inner expansion is lanceolate and not spined, and the outer one is broader with two deep emarginations (Figs. 6, 8). In the same paper, he illustrated what was thought at the time to be *E. tenuicornis* (Westwood), the only species known and which was reported from Brazil without a precise locality.

Recently, three specimens (1♂, 2♀) deposited in ZMHB, were studied and compared against the female type of *E. tenuicornis* deposited in OXUM. It was found that they are conspecific. This series collected in Brazil was again compared with the eight specimens (5♂, 3♀) previously considered as *E. tenuicornis,* and it was found that they have clear differences. This requires the description of a second species for *Empedocles,* the redescription of the genus, and the correction of localities previously refering to *E. tenuicornis,* which actually correspond to the new species.

The genus is characterized by having the hind tibiae expanded, the posterior angles of connexival segments IV to VI spined, antennal segment I internally ridged, and the pronotal disc densely tuberculate, with the area behind the callar region bearing a strong row of spines or tubercles.

The following abbreviations are used in the text: Oxford University Museum, Hope Entomological Collections, Oxford, Great Britain (OXUM); Instituto de Biología, Universidad Nacional Autónoma de México (UNAM); Zoologisches Museum, Humboldt Universität, Berlin, Germany (ZMHB):

All measurements are in millimeters.

## *EMPEDOCLES* STÅL

*Empedocles* Stål, 1867: 541.

**Redescription.** *Head.* Wider than long, subquadrate, not declivent, flat dorsally; tylus projecting beyond juga as strongly compressed plate, with apex extending upward as a single and robust conical projection; juga not visible from above, not extending past antenniferous tubercles; antenniferous tubercles oblique, unarmed, closely appressed to tylus, and distance between them less than half width of one antenniferous; posttylar sulcus evident; antennae shorter than body; antennal segment I stouter than segments II to IV, longer than maximal length of head, with outer face cylindrical, and inner face longitudinally ridged; segments II and III cylindrical, and moderately slender, and segment IV fusiform; antennal segment IV the longest, segment II longer than III, and longer or subequal to I, and segment I longer than III or subequal; ocelli barely raised, close to eyes; preocellar pit subcircular, and deep; eyes spherical, protuberant; postocular tubercle not evident; bucculae uniformly rounded, short, elevated, not projecting beyond antenniferous tubercles; rostrum reaching posterior border of mesosternum; rostral segment I the longest, segment II longer than III, and III longer or subequal to IV; rostral segments III and IV taken together shorter or subequal in length to rostral segment II. *Thorax.* Pronotum wider than long, trapezoidal, declivous, with distinct collar; frontal angles blunt; anterolateral margins obliquely straight, tuberculate; humeral angles produced laterally into broad sharp spine turning backwards (Fig. 12) or sharply spined and almost pointed outwards (Fig. 13); posterolateral margins sinuate with external third tuberculate, and internal third smooth; posterior margin slightly concave; calli slightly depressed, impunctate, separated along midline by slightly longitudinal depression; area behind callar region and pronotal disc heavily tuberculate; prosternum with deep concavity; mesosternum and metasternum flat, nonsulcate; mesosternum anteriorly tuberculate between procoxae; metapleural supracoxal spine absent; anterior lobe of metathoracic peritreme nearly circular, posterior lobe small, rounded. *Legs.* Fore and middle femora slender, armed ventrally with two rows of robust spines; spines stronger and wider on anterior row; dorsal surface smooth; hind femora incrassate, much more so in males, armed ventrally with one row of strong, large, and robust spines, with dorsal and lateral surface densely tuberculate, and provided with strong, and shorter robust spines; fore and middle tibiae cylindrical, sulcate, unarmed; hind tibiae expanded, widely in females, more narrowly in males; inner expansion slightly expanded, and strongly spined in males; inner expansion lanceolate, and not spined in females; outer expansion in males narrow, with one shallow emargination; outer expansion in females width, with two deep emarginations (Figs. 5–8). *Scutellum.* Triangular, flat, longer than wide, with apex subacute or truncated; basal third transversely elevated. *Hemelytra.* Macropterous, extending beyond apex of abdomen; apical margin slightly sinuate; costal margin emarginate. *Abdomen.* Connexival segments elevated, with posterior angles of segments IV to VI slightly spined; abdominal spiracles closer to anterior edge, far from lateral edge. *Male genitalia.* Genital capsule with posteroventral edge straight (Fig. 15) or concave (Fig. 14). *Parameres.* Shank elongate, robust; external arm convex; internal arm elongate, with wide tooth at apex (Figs. 16–17). *Female genitalia.* Abdominal sternite VII with plica and fissura; gonocoxae I elongate anteroposteriorly, in caudal view close, in lateral view with external face entire, and obliquely sinuate; paratergite VIII large, triangular, with visible spiracle; paratergite IX quadrangular, longer than paratergite VIII. Spermatheca with distal bulb nearly circular, rounded; sclerotized duct markedly coiled (more than eight coils); distal flange indistinct; proximal flange distinct; proximal sclerotized chamber spherical, large; spermathecal duct membranous (Fig. 18).

**Discussion.** *Empedocles* Stål, like *Meluchopetalops* Breddin (1903) and *Stenometapodus* Breddin (1903), has the hind tibiae expanded, antennal segment I internally ridged, and the posterior angles of connexival segments V and VI spined. In *Acanthocephala* Laporte (1832), the hind tibiae are expanded, both the posterior angles of connexival segments V and VI are unarmed, antennal segment I is not internally ridged, and the pronotum lacks the strong transverse rows of spines or tubercles below the callar region characteristic of *Empedocles.*

In *Meluchopetalops* the outer expansion of hind tibiae is lanceolate without emarginations, and the inner expansion in both sexes are slightly expanded, without emarginations (Fig. 11). In *Empedocles* the outer expansion in both sexes has one or two deep or shallow emarginations, and the inner expansion in males is slightly expanded, and strongly spined, and in females lanceolate, and not spined (Figs. 5–8). In *Stenometapodus* the outer expansion in males is straight (Fig. 9), in females slightly expanded and shorter, with one emargination, and the inner expansion in both sexes is lanceolate, slightly expanded, and shorter (Fig. 10). The pronotal disc of *Empedocles* is densely tuberculate, on the other two genera densely punctate.

**Type species.** *Metapodius tenuicornis* Westwood, 1842: 16.

### *Empedocles tenuicornis* (Westwood)
Figs. 1,3,5–6,13,15–16

*Metapodius tenuicornis* Westwood, 1842: 16.

**Discussion.** This species is easily recognized by having the humeral angles of pronotum produced laterally, not strongly broadened, and sharply pointing outward (Fig. 13); antennal segment IV yellow with the basal and apical third pale brown, and antennal segments II and III red brown with the basal third yellow (Fig. 3).

**Distribution.** First described by Westwood (1842) without any data just "habitat—?". Blote (1938) recorded this species from Brazil without a definite locality.

**Material examined.** BRAZIL, **Bahia**: 1♂, 1♀, without data (ZMHB). BRAZIL: without data (UNAM).

### **Empedocles luridus,** new species
Figs. 2,4,7–8,12,14,17–18

**Description.** *Male. Dorsal coloration.* Ground color dark orange hazel; head with yellow mediolongitudinal vitta, and laterally with narrow black stripe; ocellar tubercle bright red; antennal segment I with inner face reddish brown, and outer face orange hazel; antennal segments II and III reddish brown, and IV light yellow (Fig. 4); head and pronotum scattered with bright red diminutive spots; scutellum with apex, and two basal discoidal spots near to middle third yellow; connexival segments reddish brown, with anterior and posterior angle yellow; dorsal segments reddish brown with yellow mediolongitudinal stripe running from II to posterior margin of segment VI. *Ventral coloration.* Ground color dark orange hazel, with following areas black to dark reddish brown: anterior lobe of metathoracic peritreme, spines and tubercles of each leg, outer expansion of hind tibiae, hind coxae, hind trochanter, lateral margins of mesosternum, and abdominal spiracle; rostral segment I reddish brown, with posterior margin dirty yellow; segment II to IV dirty yellow, with apex

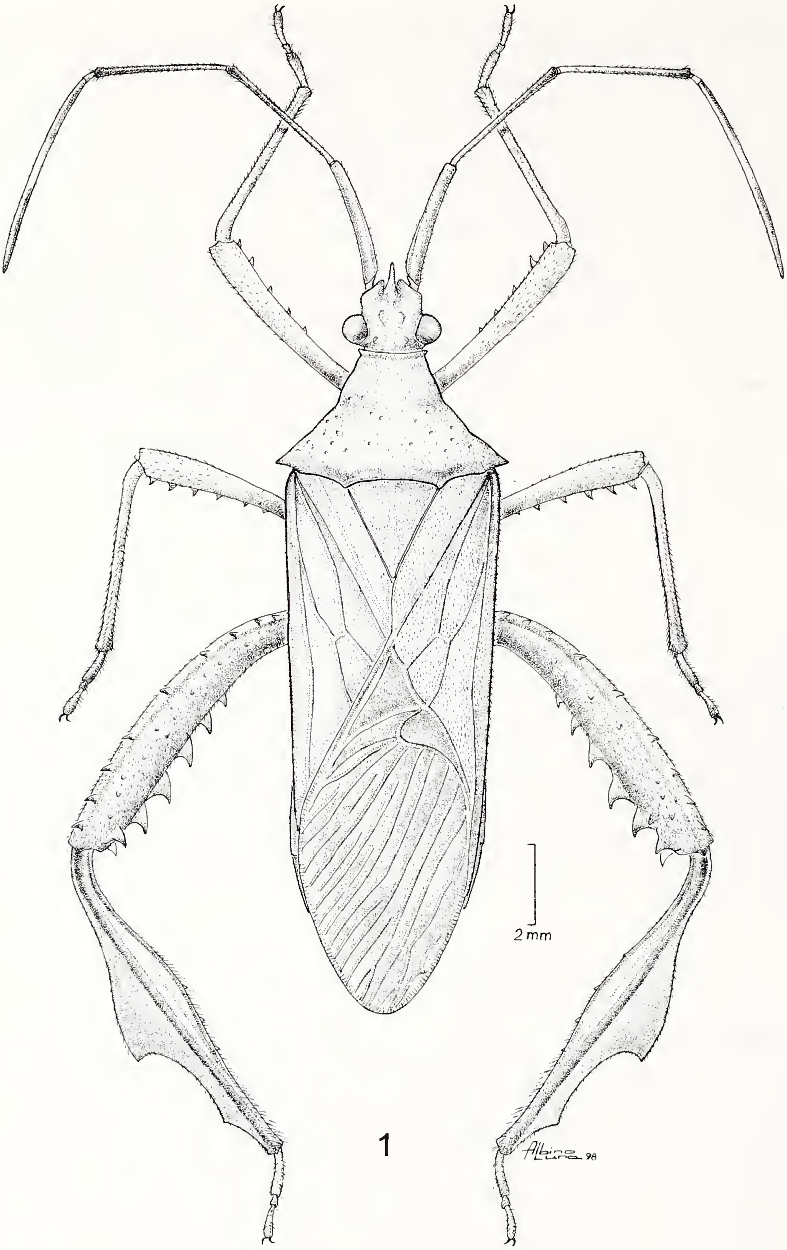

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Fig. 1. *Empedocles tenuicornis* (Westwood), dorsal view. Male.

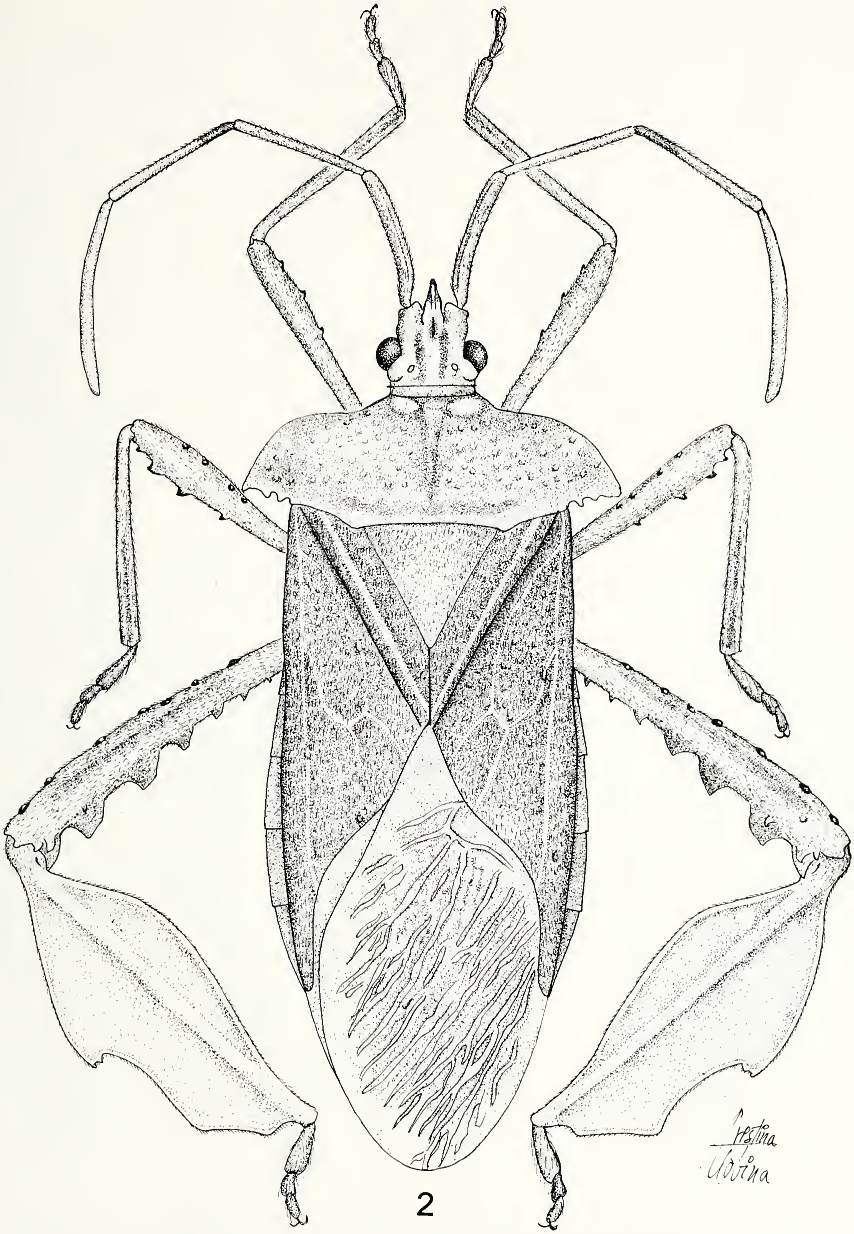

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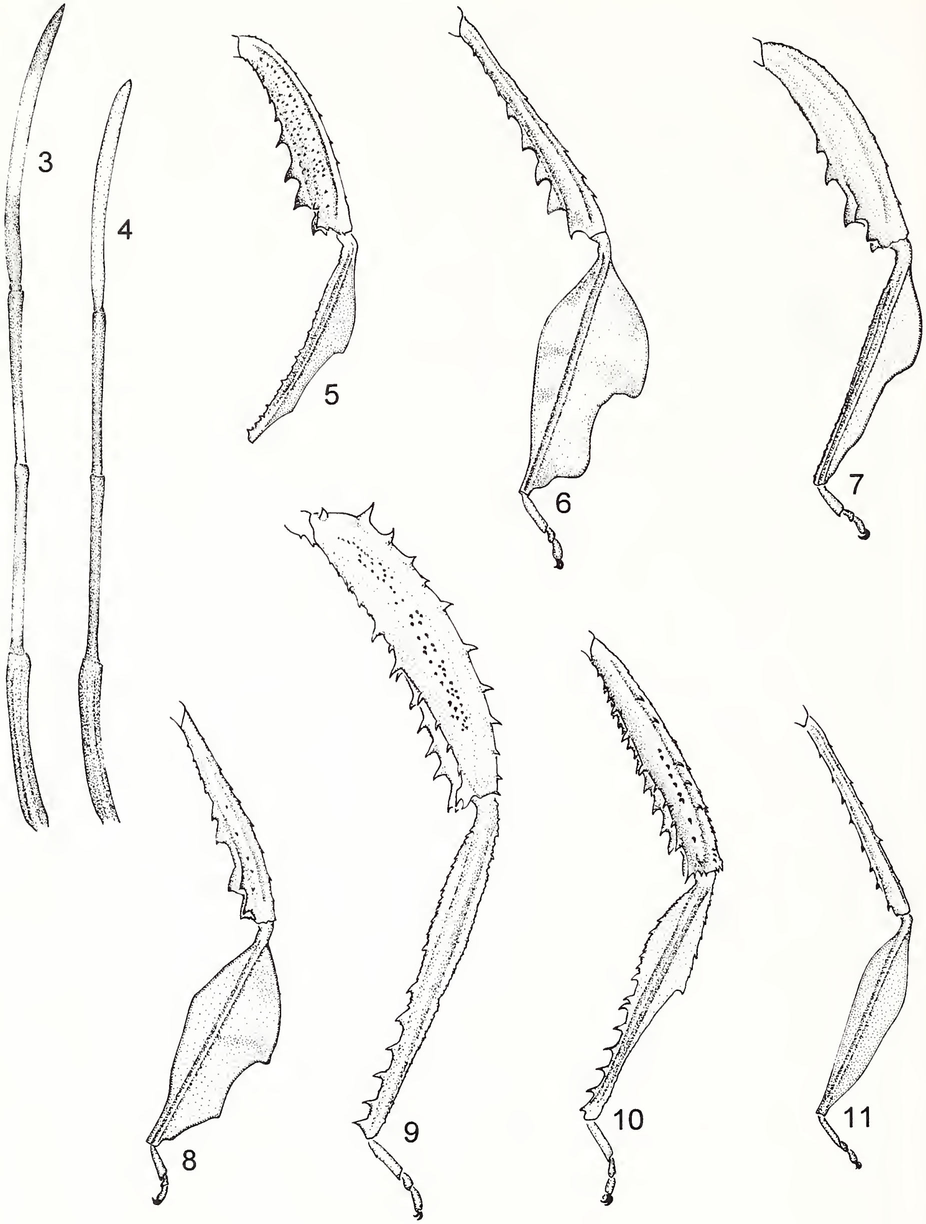
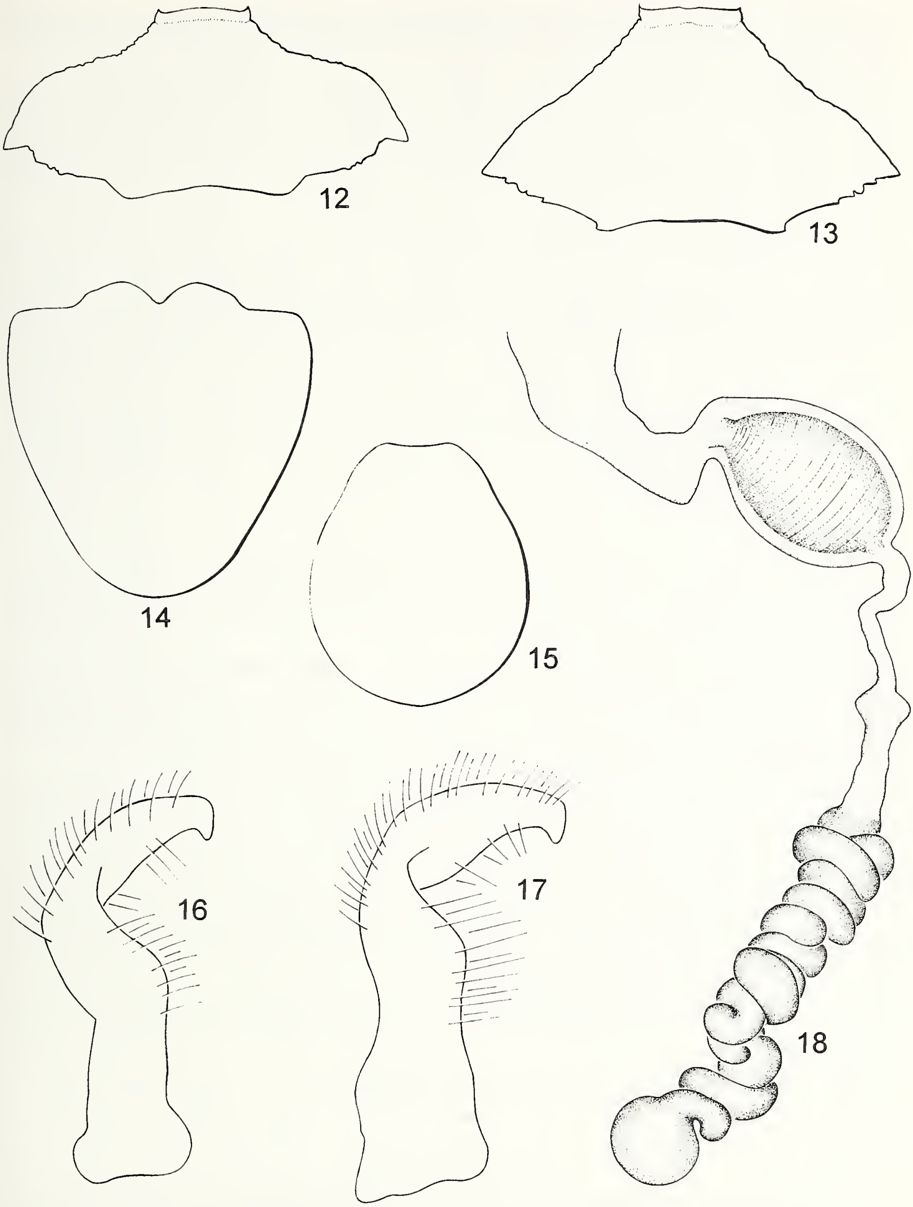
Fig. 2. *Empedocles luridus* new species, dorsal view. Female.



Figs. 3–4. Antennal segments of *Empedocles* spp. 3. *E. tenuicornis* (Westwood). 4. *E. luridus* new species. Figs. 5–8. Hind leg of *Empedocles* spp. 5–6. *E. tenuicornis* (Westwood). 5. Male. 6. Female. 7–8. *E. luridus* new species. 7. Male. 8. Female. Figs. 9–10. Hind leg of *Stenometapodus impictus* Breddin. 9. Male. 10. Female. Fig. 11. Hind leg of *Meluchopetalops banausus* Breddin (male and female same shape of leg).



Figs. 12–13. Pronotum of *Empedocles* spp. 12. *E. luridus* new species. 13. *E. tenuicornis* (Westwood). Figs. 14–15. Caudal view of male genital capsule of *Empedocles* spp. 14. *E. luridus* new species. 15. *E. tenuicornis* (Westwood). Figs. 16–17. Parameres of *Empedocles* spp. 16. *E. tenuicornis* (Westwood). 17. *E. luridus* new species. Fig. 18. Spermatheca of *Empedocles luridus* new species.

of IV black. *Structure.* Humeral angles of pronotum produced laterally, broadened, with sharp apical spine turning backwards (Fig. 12). *Genital capsule.* Fig. 14. *Parameres.* Fig. 17.

*Measurements.* Length head: 2.20; width across eyes: 2.32; interocular space: 1.28; interocellar space: 0.72; length of antennal segments: I, 3.68; II, 4.20; III, 3.76; IV, 5.40; length of labial segments: I, 2.04; II, 1.68; II, 0.82; IV, 1.00. Pronotum length: 3.92; width across frontal angles: 1.86; width across humeral angles: 7.56. Scutellar length: 2.84; width: 2.72. Total body length: 19.90.

*Female.* Similar to male. Connexival segments VIII and IX, dorsal abdominal segments VIII and IX, and genital plates light to dark orange hazel, with or without black to dark brown reflections, or connexival segments VIII and IX, and dorsal abdominal segments VIII and IX black, and genital plates dark orange hazel; inner and outer expansions of hind tibiae black to reddish brown. *Spermatheca.* Fig. 18.

*Measurements.* Length head: 2.22; width across eyes: 2.32; interocular space: 1.28; interocellar space: 0.76; length of antennal segments: I, 3.28; II, 3.64; III, 3.28; IV, 4.80; length of labial segments: I, 2.16; II, 1.80; III, 0.84; IV, 1.00. Pronotum length: 4.16; width across frontal angles: 1.96; width across humeral angles: 8.08. Scutellar length: 2.96; width: 3.00. Total body length: 20.65.

*Variation.* 1, Head in ventral view black, with buccula dark orange hazel. 2, Pronotal disc black. 3, Middle coxae black to reddish brown. 4, Propleura, mesopleura, and metapleura with diffuse black coloration. 5, Abdominal sterna black, with dark orange hazel reflections.

**Types.** Holotype, ♂, BRAZIL, **Santa Catarina,** Nova Teutonia, 27°11′N, 52°23′W, 18.v.1967, F. Plaumann (UNAM). Paratypes: 4 ♂♂, 3 ♀♀, same data as holotype except 12.i.1960, 18.i.1963, xii.1967, iii.1975, i.1977, iii.1977 (UNAM). ARGENTINA, **Misiones**: 1 ♀, San Ignacio, x.1982, D. Carpintero (UNAM).

**Discussion.** The only other previously known species, *E. tenuicornis* (Westwood), is characterized by having the humeral angles of pronotum produced laterally, relatively slender, sharply spined pointed outward (Fig. 13), with antennal segment IV yellow with basal and apical third light brown, and antennal segments II and III reddish brown with basal third yellow (Fig. 3). **E. luridus** new species, has the humeral angles produced laterally, broadened, with broad sharp spine turnning backwards (Fig. 12), with antennal segment IV entirely light yellow, and antennal segments II and III reddish brown (Fig. 4).

**Etymology.** Named for the light coloration of antennal segment IV; from the Latin, *luridus,* pale yellow.

**Distribution.** Known only from Brazil and Argentina.

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